Appl. No. 10/785,522
Amdt. dated __/__/__
Response to Office Action of 08/24/2005

Attorney Docket No.: N1085-90179
TSMC 2002-0115

REMARKS/ARGUMENTS

Claims 1-41 are pending in this application, with claims 1-14 and 39-41 withdrawn from consideration. Claims 24-33 have been allowed. Claims 15-23 and 34-38 have been rejected. Claims 17, 18, 22, 23, 37 and 38 are hereby amended and Applicant respectfully requests re-examination, reconsideration and allowance of each of pending claims 15-23 and 34-38, in addition to allowed claims 24-33.

I.   Allowable Subject Matter

Applicant thanks the Examiner, for indicating, in paragraph 9 of the Office Action, that claims 24-33 have been allowed.

II.   Claim Rejections Under 35 U.S.C. § 102

In the Office Action, specifically in paragraph 4, claims 15 and 16 were rejected under 35 U.S.C. § 102(d) as being anticipated by Wong et al., USPN 5,909,387, hereinafter "Wong". Applicant respectfully submits that these claim rejections are overcome for reasons set forth below.

Independent claim 15 recites the feature of:

> an array of one transistor split gate cells arranged into rows and columns . . .; and
>
> said first row being connected with a first word line and said second row being connected with a second word line.

The different rows of the array are connected to separate word lines in the claimed invention. Wong, in sharp contrast, provides only a single word line. Referring to Figure 3 of Wong, as pointed out by the Examiner, while each row has an associated source line, "Row decoder 320 includes a conventional decoder tree 322 of transistors that select a single word line corresponding to a row address for address generator 150", emphasis added, column 7, lines 26-28. Wong does not provide a separate word line for the first and second rows of cells in the array as in the claimed invention. Claim

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15, and therefore dependent claims 16-18 are therefore distinguished from Wong and as such the rejection of claims 15 and 16 under 35 U.S.C. § 102(b) as being anticipated by Wong, should be withdrawn.

III.   Rejection of Claims 17 and 18 Under 35 U.S.C. § 103

5   In paragraph 6 of the Office Action, claims 17 and 18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wong et al. in view of Kang, USPN 6,377,498. Applicant respectfully submits that these claim rejections are overcome for reasons set forth below.

           Claims 17 and 18 depend from independent claim 15 which, as above, is
10   distinguished from Wong and therefore claims 17 and 18 are also distinguished from the reference of Wong. Wong does not teach the claimed features of the different rows of cells in the array being connected to different word lines. Further, Wong does not teach the claimed segmenting feature. The Examiner acknowledges that Wong fails to disclose "the first and second rows connected with first and second word lines by
15   segmenting the first and second word lines into word line segments and each word line segment driven with a word line driver", subject Office Action, page 3, last paragraph.

           Each of dependent claims 17 and 18 has been amended. Claim 17 has been amended to more clearly point out that by the distinguishing feature of segmenting, it is meant that the word line associated with a particular row, is divided into word line
20   segments. Amended claim 18 now points out that each word line segment is driven with an associated word line driver.

           Kang does not disclose the claimed word line segments. Rather, Kang fails to make up for the deficiencies of Wong because whereas Kang does disclose two word lines, Kang does not disclose the configuration of the cells of the array (31, 34), much
25   less how the word lines are connected to the individual cells of the array.

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PAGE 14/18 * RCVD AT 10/12/2005 3:11:32 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/33 * DNIS:2738300 * CSID:6197442201 * DURATION (mm-ss):05-18

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Kang therefore cannot and does not disclose the word lines divided into segments with associated word line drivers wherein one of the word lines associated with a particular row is divided into segments and includes an associated driver. Kang provides an X-decoder unit 35 that provides a plurality of control signals corresponding

5   to split word lines but these signals are directed to word line drivers and then to the cell arrays only through the word line drivers, i.e., Kang does not segment each of two word lines that are coupled to different rows of cells in an array. Kang provides an alternative wherein the local X-decoder can select a first local word line driver (32) and/or a second local word line driver (33), however, the _first word line driver is also associated with a_

10   _first cell array_ and the _second word line driver is associated with a second cell array_. Kang provides a main word line driver 30 that "preferably provides a control signal for selecting either one of the first local word line driver unit 32 and the second word line driver unit 33. The local word line driver selected by the control signal is preferably enabled to provide an enable signal from the local X-decoder to a desired split word line

15   pair that corresponds to at least one selected cell", Kang, column 8, lines 26-32. The main word line driver 30, in conjunction with control signals from the X-decoder unit 35, selects one of the word line driver units 32 or 33 but each word line driver unit is only associated with one cell. _Conversely, each cell is only associated with one local word line and driver._

20   The claimed invention, in contrast, provides that, for one cell, different rows are connected to different word lines and, for each word line, multiple drivers may be used to drive different segments of the associated word line. Kang does not provide such an arrangement and therefore does not make up for the above-stated deficiencies of Wong.

25   As such, the rejection of claims 17 and 18 under 35 U.S.C. § 103(a) as being unpatentable over Wong in view of Kang, should be withdrawn.

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IV.   Rejection of Claims 19-21 and 34-36 Under 35 U.S.C. § 103

In paragraph 7 of the Office Action, claims 19-21 and 34-36 were rejected under
35 U.S.C. § 103(a) as being unpatentable over Wong in view of Shizukuishi, US Pub.
US2002/0171102.   Applicant respectfully submits that these claim rejections are
5   overcome for reasons set forth below.

Claims 19 and 34 are the independent claims of the rejected claim set. Claims
19 and 34 recite the following features:

*array

[claim 19] an array of two transistors split gate cells arranged into rows
10   and columns

[claim 34] an array of cells containing two split gate transistors arranged in
rows and columns; and

*word line connections

[claims 19 and 34] said first row being connected with a first word line and
15   said second row being connected with a second word line.

The claimed features of the separate word lines were discussed previously with
respect to claim 15 and distinguish Applicant's invention from the reference of Wong.
The reference of Shizukuishi has apparently been relied upon for providing the use of
memory cells with two split gate transistors to provide high speed reading. Shizukuishi
20   therefore does not make up for the above-stated deficiencies of Wong and therefore
independent claims 19 and 34 are distinguished from the references of Wong and
Shizukuishi, taken alone or in combination. Claims 20-21, which depend from claim 19
and claims 35-36, which depend from claim 34, are therefore similarly distinguished
from Wong in view of Shizukuishi.

25   Therefore, the rejection of claims 19-21 and 34-36 under 35 U.S.C. § 103(a) as
being unpatentable over Wong in view of Shizukuishi, should be withdrawn.

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V.   Rejection of Claims 22, 23, 37 and 38 Under 35 U.S.C. § 103

In paragraph 7 of the Office Action, claims 22, 23, 37 and 38 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wong in view of Shizukuishi, US Pub. US2002/0171102 and further in view of Kang. Applicants respectfully submit that these

5   claim rejections are overcome for reasons set forth below.

Each of claims 22, 23, 37 and 38 has been amended. Claims 22 and 37, similar to claim 17, recite the feature that the first and second word lines are divided into word line segments. Amended claims 23 and 38 recite the feature that each word line segment is driven with an associated word line driver. These features are as discussed

10   in relation to claims 17 and 18, respectively, above. Together with their dependency from claim 19, claims 22 and 23 are distinguished from the references of Wong and Kang for reasons set forth above. Similarly, together with their dependency from independent claim 34, claims 37 and 38 are distinguished from the references of Wong and Kang, taken alone or in combination, for reasons set forth above.

15   The reference of Shizukuishi has apparently been relied upon to provide memory cells with two split gate transistors and again does not make up for the above-stated deficiencies of Wong and Kang.

Claims 22, 23, 37 and 38 are therefore distinguished from the references of Wong in view of Shizukuishi and further in view of Kang, and therefore the rejection of

20   these claims under 35 U.S.C. § 103(a) should be withdrawn.

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CONCLUSION

Based on the foregoing, each of pending claims 15-23 and 34-38 is in allowable form together with previously allowed claims 24-33. The application is therefore in condition for allowance, which action is respectfully and expeditiously requested.

5   The Assistant Commissioner for Patents is hereby authorized to charge any fees or credit any excess payment that may be associated with this communication to Deposit Account 04-1679.

Respectfully submitted,

Dated: 12 October 2005
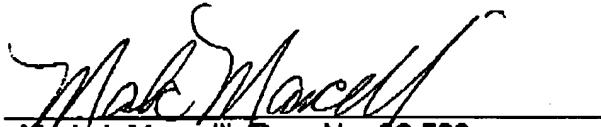
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